

## Claims

What is claimed is:

- 5081
1. A method for etching a layer of silicon nitride comprising:  
  
etching said silicon nitride layer with an etchant consisting essentially of oxygen at a flow rate of between about 20 sccm and about 80 sccm and one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  at a flow rate of between about 5 sccm and about 25 sccm.
  2. The method of claim 1 further comprising introducing said oxygen and said one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  into an etch chamber at a ratio of about 3:1 during said etching.
  3. The method of claim 1 further comprising subjecting said silicon nitride layer to a pressure of between about 10 millitorr and 60 millitorr and a power of between about 300 watts and about 600 watts during said etching.
  4. The method of claim 1 further comprising introducing said oxygen into an etch chamber at a flow rate of between about 35 sccm and about 60 sccm and introducing said one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  into said etch chamber at a flow rate of between about 10 and about 20 sccm during said etching.
  5. The method of claim 4 further comprising subjecting said silicon nitride layer to a pressure of between about 30 millitorr and 60 millitorr and a power of between about 300 watts and about 500 watts during said etching.
  6. The method of claim 1 further comprising introducing oxygen into an etch chamber at a flow rate of about 60 sccm and introducing said one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  into said etch chamber at a flow rate of about 20 sccm during said etching.
  7. The method of claim 6 further comprising subjecting said silicon nitride layer to a pressure of between about 30 and 40 millitorr and a power of between about 300 watts and about 400 watts during said etching.

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- Sub 13
8. A method used during the formation of a semiconductor device comprising:
- providing a semiconductor wafer assembly comprising at least one of a layer of silicon and a layer of silicon dioxide;
- forming a layer of silicon nitride over said at least one of said layer of silicon and said layer of silicon dioxide;
- etching said silicon nitride with an etch consisting essentially of oxygen and one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$ , wherein said etch exposes said at least one of said layer of silicon and said layer of silicon dioxide.
9. A method used during the formation of a semiconductor device comprising:
- providing a semiconductor wafer assembly comprising a silicon wafer and a layer of silicon dioxide overlying said wafer;
- forming a layer of silicon nitride over said silicon wafer and over said layer of silicon dioxide;
- placing said semiconductor wafer assembly into an etch chamber;
- etching said silicon nitride layer using an etch consisting essentially of oxygen and one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  to expose said silicon dioxide layer and said silicon wafer.
- Sub 12
10. The method of claim 9 further comprising introducing said oxygen and said one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  into said etch chamber at a ratio of about 3:1 during said etching.
11. The method of claim 9 further comprising introducing oxygen into said chamber at a flow rate of between about 20 sccm and about 80 sccm and introducing said one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  into said etch chamber at a flow rate of between about 5 sccm and about 25 sccm during said etching.

12. The method of claim 11 further comprising subjecting said silicon nitride layer to a pressure of between about 10 millitorr and 60 millitorr and a power of between about 300 watts and about 600 watts during said etching.

13. The method of claim 9 further comprising introducing said oxygen into said chamber at a flow rate of between about 35 sccm and about 60 sccm and introducing said one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  into said etch chamber at a flow rate of between about 10 sccm and about 20 sccm during said etching.

14. The method of claim 13 further comprising subjecting said silicon nitride layer to a pressure of between about 30 millitorr and 60 millitorr and a power of between about 300 watts and about 500 watts during said etching.

15. The method of claim 9 further comprising introducing said oxygen into said chamber at a flow rate of about 60 sccm and introducing said one of  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$  into said etch chamber at a flow rate of about 20 sccm during said etching.

16. The method of claim 15 further comprising subjecting said silicon nitride layer to a pressure of between about 30 millitorr and 40 millitorr and a power of between about 300 watts and about 400 watts during said etching.